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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/517,352	06/24/2005	Philip George Howlett	16582-0001	4041
25267 7590 08/07/2007 BOSE MCKINNEY & EVANS LLP JAMES COLES 135 N PENNSYLVANIA ST SUITE 2700 INDIANAPOLIS, IN 46204			EXAMINER NGUYEN, THU V	
			ART UNIT 3661	PAPER NUMBER
			MAIL DATE 08/07/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/517,352	<b>Applicant(s)</b> HOWLETT ET AL.	
	<b>Examiner</b> Thu Nguyen	<b>Art Unit</b> 3661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 11 July 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 2-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2,3,6 and 7 is/are rejected.
- 7) ☒ Claim(s) 4,5 and 8 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 November 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>11/19/04; 7/18/07</u> . | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

The preliminary amendment filed on July 11, 2007 has been entered. By this amendment, claim 1 has been canceled, claims 2-8 have been added and claims 2-8 are now pending in the application.

#### ***Specification***

1. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. *It is important that the abstract not exceed 150 words in length* since the space provided for the abstract on the computer tape used by the printer is limited.

*The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided.*

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

2. The disclosure is objected to because of the following informalities:
  - a. In the specification page 4, lines 25-26, the specification does not indicate a drawing that illustrate trains A, C and the segments 4, and 6.
  - b. In the specification page 6, line 13, the abbreviation GAMS should be defined.

- c. In the specification page 9, line 22, the misspelled "From" in step 3 should be corrected to "Form".
3. The disclosure on page 9, lines 17-30 is objected to as being ambiguous. Details on specific ambiguities are explained in the section 112 2<sup>nd</sup> paragraph rejection on claim 2 below.

Applicant is required to submit an amendment which clarifies the disclosure so that the examiner may make a proper comparison of the invention with the prior art.

Applicant should be careful not to introduce any new matter into the disclosure (i.e., matter which is not supported by the disclosure as originally filed).
4. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

#### **Arrangement of the Specification**

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.

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(f) BACKGROUND OF THE INVENTION.

(1) Field of the Invention.

(2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.

(g) BRIEF SUMMARY OF THE INVENTION.

(h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).

(i) DETAILED DESCRIPTION OF THE INVENTION.

(j) CLAIM OR CLAIMS (commencing on a separate sheet).

(k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).

(l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A

"Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

The specification lacks section (h) (brief description of the several views of the drawings).

***Claim Objections***

5. Claim 3 is objected to because of the following informalities:

In claim 3, lines 7, the claimed "where  $a_{id}$  is the actual arrival time of train  $i$  at is destination" should be corrected to "where  $a_{id}$  is the actual arrival time of train  $i$  at the train's destination".

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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7. Claims 2-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- a. In claim 2, lines 5-6, step (ii) teaches selecting a train with the earliest start time from its current location. The claim does not teach how the selected train be used in other steps in the claim. Step (ii) does not seem to have any useful application.
- b. In claim 2, lines 9-10, step (iv) teaches selecting a train from the contender set. The claim does not teach how the selected train be used in other steps in the claim. Step (iv) does not seem to have any useful application.
- c. In claim 2, line 11, and in line 15, step (v) and step (vi) , the claimed "said selected train" lacks of antecedent basis and ambiguous. There are two trains selected in step (ii) and step (iv), it is not clear which train the limitation "said selected train" refers to.
- d. Other claims are rejected as being dependent on the rejected base claim.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 2-3, 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harker et al (US 5,177,684).

As per claim 2, Harker teaches a method of moving a given set of trains from their respective origins to their respective destinations (col.6, lines 9-13), the method comprising steps: (i) forming a schedulable set of trains consisting of all trains not at their destination that have at least one unoccupied link (col.4, lines 54-58); (iii) forming a contender set of trains consisting of all trains that have as their next move a dispatch from station Si to Sj and vice-versa (col.5, lines 65-67); Since Karker teaches determining minimum travel time for each train (col.31-32, lines 5-6 of the last paragraph) and selecting train schedule with minimal cost (col.37-38, lines 39-42), Karker obviously encompasses teaching selecting the train with the earliest arrival time at its successor station either station Si to Sj and invoking a deadlock avoidance procedure (col.35 and 36, first potential conflict train module). Karker does not explicitly teach that from the schedulable set select the train with the earliest start time from its current location, removing unselected train from the schedulable set; schedule the selected train over its chosen link to its successor station; continuing scheduling if the schedulable set is not empty. However, since Karker teaches the capability to track and update the train's scheduled time and the ability to alternate meet-pass plans to minimize delay cost (col.47, lines 41-64), Karker further teaches assigning the departure (start) time, the arrival time (col.31-32) and suggests ordering the train in accordance with the desired order of departure from their starting point (col. 31-32), it would have been obvious to an ordinary person skilled in art to select the train with the earliest start time in order to order the train in accordance with the desired ordered, and to remove train schedule might possibly cause the deadlock in order to minimize the conflict to ensure smooth schedule for all the trains.

As per claim 3, since Harker teaches taking lateness into consideration (para 37 and 38) and since it would have been well known that the lateness of a vehicle at a location is the

difference between the arrival time and the expected time at the location, and when the train arrive earlier than the expected time, there is not delay time (no lateness), Harker obviously encompasses teaching the objective function as claimed,

As per claim 6, Harker teaches using a heuristic method to remove infeasible train movement (to minimize cost) (col.43-44 (accelerated (heuristic) lower bound based algorithm)).

As per claim 7, Harker teaches that the perturbations of train start times, and train finish times are made to enable the generation of a plurality of different sequences of dispatch decisions (station dwell time in col.33-34).

***Allowable Subject Matter***

10. Claims 4-5 and 8 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

11. The following is a statement of reasons for the indication of allowable subject matter: Prior arts of record do not disclose a method for moving a given set of trains disclosed in claim 2 including scheduling method taught in claim 2 in which the track capacity constraints are included in the objective function by means of langrange multipliers. Prior art of record also does not disclose a method for moving a given set of trains disclosed in claim 2 including scheduling method taught in claim 2 in which the dispatch decisions are generated using perturbations of trains start times and train finish times, the size of the perturbations is governed by the parameter taught in claim 8.




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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thu Nguyen whose telephone number is (571) 272-6967. The examiner can normally be reached on T-F (7:30-6:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Black can be reached on (571) 272-6956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

July 27, 2007

  
**THU V. NGUYEN**  
**PRIMARY EXAMINER**